

in red be approved for entry in this application. The proposed drawing corrections change reference character 22 to reference number 25 in Figure 1 and label Figures 1-5 as "prior art". In anticipation of approval of the proposed drawing corrections, corrected Formal Drawings are concurrently filed.

Claims 1, 4, 5, 7-9 and 12 of this application were identified as conflicting with claims 1, 4, 5, 7-9 and 12 of application No. 09/742,281 [sic; 09/742,279]. The applicant was required to either cancel the conflicting claims or to maintain a clear line of demarcation between the applications. Further, in this regard, claims 1, 4, 5, 7-9 and 12 were provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over certain claims of copending Application No. 09/742,279.

Applicant respectfully traverses the Examiner's identification of conflicting claims and provisional rejection under the judicially created doctrine of obviousness-type double patenting. Indeed, it is respectfully submitted that in spite of the similarities between this application and the subject matter of copending Application No. 09/742,279 (the '279 application) the modifications described and claimed in these two cases are for two very different reasons and have different beneficial effects and it is possible that in some machines one effect may be more important than the other. It is respectfully submitted that the structures recited are therefore distinct and are appropriately separately claimed and do not conflict with one another.

More particularly, in a preferred embodiment of each application, the recited modifications are to the portion of the endwinding spaceblock, e.g., that protrudes down into the annular gap between the bottom of the rotor endwindings and the rotor spindle, and impact the interactions of the endwinding spaceblock with the flow through that gap. Typically, such spaceblocks are shaped like a block having a planar downstream wall, providing a nominally inefficient interaction with the flow field. In accordance with the invention disclosed and claimed in this case, the spaceblock is modified to have a downstream wall with a non-planar contour for reducing generated

wake. In other words, the block is streamlined. Doing so, especially on air-cooled reverse flow generators, minimizes the drag on the block which in turn minimizes the amount of annular momentum added to the annular gap flow. This maintains a higher difference between the annular gap rotational velocity and that of the endwindings, which in turn increases the heat transfer in the endwindings and therefore the cooling effectiveness. In machines where the endwinding is the thermally limited, the invention would therefore have a significant impact.

In the '279 application, it is proposed to shape blocks in such a way that they behave as a turning vane or blade, so as to increase the angular momentum of the annular gap flow, exactly the opposite effect of the invention described and claimed in this case. This will hurt thermal performance of the rotor endwinding. However, it is known that the largest flow loss in the machine is the rotor subplot inlet and this is made worse when the annular gap rotational velocity is slower than the rotor itself. Therefore, the '279 invention seeks to use the block protrusions in an efficient manner to intentionally increase the rotation speed of the gas, thus decreasing the losses at the rotor subplot inlet, increasing the total rotor flow, and thus decreasing the temperature of the rotor or similarly allowing more rating for the same temperature. Such a structure would be helpful, for example, in hydrogen gas cooler generators, where the endwindings are generally at a similar level of thermal performance to the rest of the rotor.

Therefore, while the Examiner is correct that this application and the '279 application provide a downstream wall of the spaceblock having a non-planar contour, the non-planar contour in each case is provided to do opposite things as recited respectively in the two cases. They can both have a beneficial effect and a skilled artisan will be able to apply the subject invention in some machines to benefit and the '279 invention in other machines to benefit. Both inventions result in better performance than the conventional block-shaped spaceblocks.

The Examiner has emphasized in his rejection that the "apparatus claims must be structurally distinguishable from the prior art". It is understood that the Examiner's quote in this regard relates to the functional limitation at the end of claim 1 of this application and the functional limitation included at the end of claim 1 of the copending '279 application. It is respectfully submitted that the functional limitations included in each of these claims respectively limit the structure recited therein.

Applicant is not attempting to use functional language in lieu of structure. Applicant is employing functional language to further limit the recited structure.

It is well settled that there is nothing intrinsically wrong with the use of functional language in a claim. In re Ludtke, 169 U.S.P.Q. 563 (C.C.P.A. 1971); In re Swinehart, 169 U.S.P.Q. 226 (C.C.P.A. 1971).

The C.C.P.A. addressed the issue of functional language limiting the claimed structure. In re Venezia, 189 U.S. P.Q. 149 (C.C.P.A. 1976), in addressing a Section 112 rejection, the C.C.P.A. stated that the claimed invention included structural limitations on each part and those structural limitations were defined by how the parts are to be interconnected in the final assembly. Id. at 151. The court stated that the terms "adapted to be affixed" or "when said housing is in its repositioned location", for example, define present structures or attributes of the parts identified, which limit that structure. The court further stated that there is nothing wrong in defining structures of the components of the completed assembly in terms of the interrelationship of the components, or the attributes they must possess. Id. at 152.

The C.A.F.C. in Pac-Tec Inc. v. Amerace Corp., 14 U.S.P.Q. 2d 1871 (Fed. Cir. 1990) affirmed that district court's finding of validity. The district court found, when considering the claims as wholes, functional language such as "adapted to" and "thereby", for example, constitutes structural limitations, citing In re Venezia, and that functional language cannot be disregarded in such cases. Pac-Tec Inc. v. Amerace Corp., at 1876.

In view of the foregoing, reconsideration and withdrawal of the Examiner's provisional rejection is respectfully requested and it is respectfully submitted that the claims presented in this case and those in copending '279 application do not conflict but rather each recite structures having distinct and different characteristics.

Claims 1-16 were rejected under 35 USC 102(b) as being anticipated by Belfils. Applicant respectfully traverses this rejection.

It is respectfully submitted that Belfils does not anticipate nor render obvious the invention claimed and indeed has little relevance to the invention of applicant's independent claims 1 and 9. Belfils describes a very large spaceblock that fills predominately the entire endstrap region. The spaceblock has grooves 14 and 15 in its axially facing sidewall that make the spaceblock take the shape of an impeller blade. That is the block has two long sweeping grooves machined in it that start from the bottom right corner of the block (with the right side of the block leading the direction of rotation) and curving towards the upper left corner of the block. This tends to accelerate a portion of the flow from the annular gap beneath the unwinding through the machined passages, thus sweeping along the end strap face and removing heat. The gas then flows along the coil side of the endwinding and exits the rotor through passages 22 machined in the teeth of the rotor. To further force the gas through this pattern, baffle plates 19 are installed under a portion of the endwinding separating the endwinding flow from the flow in these endwinding passages. Figure 3 of Belfils is an elevational view of the side wall of an exemplary spacing member 8. The grooves 14 and 15 are thus defined in the sidewall and do not teach or suggest any non-planar configuration of a downstream wall of spacers 8. The downstream wall of the spacer 8, as can be seen from Figure 2 and the left hand edge of Figure 3, are planar (flat) as in the prior art. Thus, Belfils teaches only grooves defined in a sidewall of a spaceblock and do not teach or suggest a non-planar configuration of the downstream wall of a spaceblock, much less for reducing generated wake as defined by applicant's independent claims 1 and 9.

With respect to dependent claims 2 and 10, as noted above, Belfils teaches a planar (flat) downstream wall and therefore does not anticipate nor render obvious a spaceblock downstream wall having an aerodynamic contour as claimed by applicant, much less in a configuration to reduce the extent and strength of generated wake. In fact, because Belfils provides baffle plate 19, the only flow to the area downstream of his spaceblock is that from grooves 14 and 15 and there is no teaching whatsoever of configuring his downstream wall to control wake or any other characteristics of the flow into the cavity downstream thereof.

With respect to claims 3 and 6, because the downstream wall is planar (flat) in Belfils, it cannot properly be said that the downstream wall is defined as a generally parabolic curve. The curvature of the grooves defined the sidewall of Belfils does not teach or suggest that the downstream wall of the spaceblock should be defined as a generally parabolic curve.

With regard to claims 5 and 13, Belfils teaches only a main body portion that defines the upstream and downstream walls. Even if the portion of Belfils side wall defined between his grooves 14 and 15 (16) were characterized as a protrusion portion, it does not define the downstream wall of the spaceblock of Belfils.

With respect to new claims 17 and 18, it is respectfully noted that due to the presence of baffle plate 19, it is not possible for Belfils' spaceblocks to extend into the annular space between the endwindings and the spindle. Thus, Belfils certainly does not anticipate nor render obvious the subject matter of these claims.

For all the reasons advanced above, it is respectfully submitted that the invention claimed is not anticipated by nor obvious from Belfils.

All objections and rejections having been addressed, it is respectfully submitted that the present application is in condition for allowance and an early Notice to that effect is earnestly solicited.

Respectfully submitted,

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